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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,237	12/08/2003	Jung-Sun Kang	8045-44 (PX1585-US/SSD)	2525

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EXAMINER	
WONG, ALLEN C	

ART UNIT	PAPER NUMBER
2621	

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07/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/730,237	KANG, JUNG-SUN	
	Examiner	Art Unit	
	Allen Wong	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 June 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 7-9* is/are rejected.

7)☒ Claim(s) *4-6* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Species I, claims 1-9, Figure 9 in the reply filed on 6/22/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

For the following communication, the non-elected claims 10-20 should be listed as cancelled with the status identifiers.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1-3 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanami (6,765,965) in view of Ohtani (6,671,321).

Regarding claim 1, Hanami discloses a motion estimator of a video encoder, comprising:

a search region data memory for storing video data of a previous video frame (fig.29, elements 41-42 store the video data of the previous video frame);

a macroblock data memory for storing macroblock data of a current video frame (fig.29, element 40 stores the current video frame in that the video frame comprises the plurality of macroblocks);

a first sub sampling circuit for sub-sampling by ratio M:1 the video data of a previous frame read from the search region data memory in response to a sub-sampling rate control signal (fig.29, element 66 and col.20, ln.32-44);

a second sub-sampling circuit for sub-sampling, by ratio M:1, current video frame data read from the macroblock data memory in response to the sub-sampling rate control signal (fig.29, element 60 and 61 for sub-sampling the current video frame data, where element 70 is a controller that control the distribution of search areas);

a search region deciding circuit for outputting a search region decision signal (fig.27, Hanami discloses the search area SAA of MD#A for performing and outputting a search region decision data for MD#A, and fig.28, Hanami discloses the search area SAB of MD#B for performing and outputting a search region decision data for MD#B; also see fig.31 shows the details of element FMD# of fig.24 in that element 81 for determining the output of the search region decision data);

a processing element (PE) array network for sequentially calculating a SAD (sum of absolute differences) value of the data outputted from the first sub-sampling circuit and the search region data outputted from the data array circuit, according to a designation of the search region decided by the search region deciding circuit, to sequentially output a plurality of SAD values (fig.24 and 29, element 1 comprises MD#A

and MD#B for sequentially calculating the sum of absolute differences from data obtained from sub-sampling unit 66);

a motion vector comparator for receiving the plurality of SAD (sum of the absolute differences) values sequentially outputted from the PE array network, and comparing the SAD value with a previous SAD value, to detect a minimum SAD value as a motion vector value (fig.24 and 29, element 1, Hanami discloses "FINAL MOTION DETERMINING UNIT" that receives the plurality of sum of absolute values resulted from RMA and RMB, ascertained from elements MD#A and MD#B, for determining the final optimum motion vector from a plurality of motion vector data values).

Hanami does not specifically disclose a data array circuit for arraying video data outputted from the first sub-sampling circuit so that motion vector estimation candidates can be outputted sequentially a second sub-sampling circuit for sub-sampling, by ratio M:1, current video frame data read from the macroblock data memory in response to the sub-sampling rate control signal. However, Ohtani teaches the utilization of arraying, gathering or organizing of the video data from the sub-sampling of search areas in that the motion vector estimation candidates can be sequentially outputted (fig.4-5, note the search region A is prioritized as first, the search region B-C is prioritized as second, the search region D-E is prioritized as third, the search region F-I is prioritized as fourth, where the search positions and search sizes are varied, as well as the sub-sampling). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Hanami and Ohtani, as a whole, for advantageously, robustly detecting and outputting a motion vector with a high precision so as to produce

high quality images at the display without increasing hardware requirements (Ohtani col.5, ln.21-25).

Regarding claim 2, Hanami discloses further comprising: a macroblock measure circuit for receiving the current frame video data read from the macroblock data memory to calculate the sum of absolute differences between a mean intensity of a macroblock and an intensity of each pixel of the macroblock (fig.27, Hanami discloses the search area SAA of MD#A for performing and outputting a search region decision data for MD#A); and wherein the search region deciding circuit is adapted to output the search region decision signal based upon the sum (A) of absolute differences between a mean intensity of a macroblock and the intensity of each pixel of the macroblock as calculated by the macroblock measure circuit (fig.27, Hanami discloses the search area SAA of MD#A for performing and outputting a search region decision data for MD#A, and fig.28, Hanami discloses the search area SAB of MD#B for performing and outputting a search region decision data for MD#B; also see fig.31 shows the details of element FMD# of fig.24 in that element 81 for determining the output of the search region decision data).

Regarding claim 3, Hanami discloses further comprising a comparator for selecting an intermode or an intramode based upon a comparison of the sum (A) of the absolute differences between the mean intensity of the macroblock and the intensity of each pixel of the macroblock, with a predetermined threshold value (fig.18, note the memory distance decision unit 55d decides how close are the relationships between the adjacent frames, thus, intermode or intramode is determined).

Regarding claim 7, Hanami discloses wherein a +-4 pixel search region for a 4x4 pixel block is operatively divided into four +-2 pixel search regions, and the PE array network sequentially searches the four .+-.2 pixel search regions to sequentially output the SAD values for the 4x4 pixel block within the +-4 pixel search region (fig.5 and fig.29, note the use of MD#A and MD#B, in that the search regions are adjustable).

Regarding claim 8, Hanami discloses wherein for performing a search for a 8x8 pixel block within a +-2 pixel search region, the 8x8 pixel block is operatively divided into four 4x4 pixel sub-blocks, and the PE array network sequentially searches for each of the 4x4 sub-blocks within the +-2 pixel search region and sequentially outputs four SAD values for each one of the 25 search points within the +-2 pixel search region (fig.8, note search can be done for a 8x8 block as illustrated in MD#1; fig.29, note the use of MD#A and MD#B, in that the search regions are adjustable).

Regarding claim 9, Hanami discloses wherein for performing a search for a 16x16 pixel macroblock within a search region, the 16x16 pixel macroblock is operatively divided into sixteen 4x4 pixel sub-blocks, and the PE array network sequentially searches for each of the 4x4 sub-blocks within the search region and sequentially outputs sixteen SAD values for each one of the search points within the search region (fig.8, note search can be done for a 16x16 block as illustrated in MD#2; and fig.29, note the use of MD#A and MD#B, in that the search regions are adjustable).

Allowable Subject Matter

Claims 4-6 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John W. Miller can be reached on (571) 272-7353. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Allen Wong
Primary Examiner
Art Unit 2621

AW

6/28/07